Response to Prebid Meeting: Dynotech

SN	Query	Technical Committee Response	Remark
Dynotech			
1	Clarification sought on: o Retention money (5%) o Performance Bank Guarantee (3%) Vendor suggested that generally only one of the two is applicable.	**Accepted.** The requirement for Performance Bank Guarantee (PBG) is withdrawn. Retention Money shall remain applicable as per the tender conditions.	Tender specification amended accordingly.
2	Vendor to submit consolidated technical queries via email by Monday evening.	No technical queries were received from the vendor within the stipulated timeline.	No change in specification.

Response to Prebid Meeting: MACK INTERNATIONAL

SN	Query	Technical Committee Response	Remark
MACK INTERNATIONAL			
1	We suggest a plasma source with a growth rate of around 1.2 to 1.4 μm/h for Gallium Nitride growth. Please note that for h-BN typical growth rates will be lower.	**Accepted.** The minimum demonstrated h-BN growth rate requirement is revised to ≥ 1.4 μm/h using the specified plasma source configuration. All other performance requirements remain unchanged.	Tender specification amended accordingly.
2	Can you confirm that the 1450°C Substrate manipulator temperature is to be measured at the Thermocouple position. The surface temperature on the wafer will be usually lower and depend on the substrate material.	**Confirmed.** The specified temperature refers to the temperature measured at the manipulator thermocouple location under standard operating conditions.	Clarification only; no change in specification.
3	Suggestions for clarification of typographic errors: a) Please confirm that contrary to section 4.7, the Substrate manipulator should be mounted along the vertical axis, with the wafer surface facing down horizontally.	**Accepted.** The substrate manipulator shall be vertically mounted with the substrate facing downward during growth.	Tender specification corrected.
	b) Item 3.4 states four-filament TSP. Note that most TSP on the market have three filaments.	**Accepted.** Requirement revised to minimum three (3) filaments or equivalent performance.	Tender specification amended.
4	We recommend to increase the lead time of the tender from 10 months to 12 months in order to ensure a overall realistic timeline allowing the vendors to provide a customized and optimized solution for Plaksha University.	**Partially Accepted.** Considering the project timelines, the maximum delivery period is revised from 10 months to 11 months from the date of PO/LC issuance.	Tender specification amended.
5	We kindly ask to extend the tender submission deadline by one or two weeks, as the current	**Accepted.** Tender submission deadline is extended to 23 June 2026.	Corrigendum to be issued.

	tender timeline may not allow to consider any addendum published by Plaksha University.		
6	The 1% over a 1-inch wafer thickness homogeneity (excluding ≤ 2.5mm edge area), to be demonstrated at acceptance is an important criteria to ensure offers from a competent and serious vendor.	**Accepted.** Thickness homogeneity shall be interpreted as ±1% variation across the specified wafer area.	Clarification only.
7	We suggest to put the following items in the "OPTIONAL" section in order to make sure that the initial offer can be the most economical solution for Plaksha university; And that the additional features can be retrofitted later in the future in case they are needed:		
	a) Differential pumping for RHEED as option, so that it can be upgraded in the future, but not included in the initial delivery	**Accepted**. Differential pumping for RHEED is moved to the optional configuration list.	Tender specification amended.
	b) Start with fully shared pumping of the entire load lock as long as the base pressure specification for the loadlock is still met, and leave a seperate pump as an optional upgrade	**Not Accepted**. Independent isolation of the load-lock chamber is required to ensure contamination-free substrate handling and protection of UHV growth conditions.	Specification retained.
	c) Consider the use of a manually operated gate valve at the transfer position between loadlock and growth chamber as this will ensure more safe operation with the also manual sample transfer operation.	**Accepted.** Pneumatic gate valves may be supplied with manual override capability.	Tender specification amended.
	d) Change the specification of the "State-of-the-art" PC to a more generic model that is suitable for operation of the normal vacuum and process control.	**Not Accepted.** The specified workstation configuration is required to support advanced process control, automation, data logging, and future system upgrades.	Specification retained.
	e) Open up to more economic alternative proposals by vendors for the pumping of the deposition chamber (item 3) and only set the minimum base pressure that needs to be attained and not the precise type and model of pumps to be used.	**Not Accepted**. The specified vacuum architecture has been defined to ensure uniform evaluation of bids and achievement of required performance parameters. Equivalent solutions meeting all specifications may be proposed subject to technical evaluation.	Specification retained.

Response to Prebid Meeting: Anarghya Innovations & Technology Pvt. Ltd.

SN	Query	Technical Committee Response	Remark
Anarghya Innovations & Technology Pvt. Ltd.			
1	Proposal to reduce RHEED specification from 15 keV to 10 keV for cost optimization.	**Not Accepted.** The specified 15 keV RHEED system is required to ensure high-quality in-situ surface characterization and compatibility with advanced epitaxial growth studies.	No change in specification.

2	Request to allow equivalent thickness monitor systems instead of specified model.	**Accepted.** Equivalent thickness monitoring systems may be offered, provided they meet or exceed the specified performance and functionality requirements.	Equivalent systems are acceptable subject to technical evaluation.
3	Discussion on substrate temperature requirements for hBN growth.	**Clarified.** The specified substrate temperature requirement shall remain unchanged to ensure compatibility with high-quality hBN growth processes.	No change in specification.
4	Suggestion to eliminate heating facility in preparation / load-lock chamber for cost optimization.	**Not Accepted.** Heating capability in the preparation/load-lock chamber is required for substrate degassing and contamination control prior to growth.	No change in specification.
5	Proposal to avoid duplicate TMP in growth and load-lock and proposed to share pumping configuration.	**Not Accepted.** Independent pumping of growth and load-lock chambers is required to maintain UHV conditions, minimize contamination risk, and ensure operational flexibility.	No change in specification.
6	Discussion on edge exclusion and layer homogeneity criteria from 2.5% to 5%.	**Not Accepted.** The specified edge exclusion and layer homogeneity requirements are essential to achieve wafer-scale uniformity and reproducibility.	No change in specification.
7	Clarification sought on acceptable stainless steel grades and equivalents.	**Clarified.** UHV-compatible stainless-steel grades meeting the specified vacuum, bake-out, and contamination requirements shall be acceptable.	Clarification only.
8	Suggestion to revise nitrogen plasma growth rate specifications to around 1 µm/hr	**Accepted.** The minimum demonstrated growth-rate requirement is revised to ≥1.4 µm/hr.	Tender specification amended accordingly.

Response to Prebid Meeting: Xytel India Pvt Ltd.

SN	Query	Response	Remark
Xytel India Pvt Ltd.			
1	RHEED 15kEv with differential pumping: Rheed 15kEv with differential pumping. Differential pumped RHEED is known as TORR RHEED which is a different model with far higher costs and is only used for higher pressures. The RHEED we propose is suited for **MBE growth** with and without process gas, **analytical RHEED**, and other deposition systems with pressures **up to 1 millitorr** (1 x 10^{-3} Torr)	**Accepted.** Differential pumping for RHEED is moved to the optional configuration list.	Tender specification amended.

2	RF Plasma N plasma: RF 50/63 with 3 piece cavity N plasma source from Riber including 600W power supply, manual gas and manual tuning system. **For 2.5 to 7.6 microns/h require approx. 5880 holes.** No oxygen cavity included	**Accepted.** Minimum growth-rate requirement revised to ≥1.4 μm/h.	Tender specification amended.
3	Layer homogeneity 1% to +/-1 %	**Accepted.** Uniformity shall be interpreted as ±1% across the specified area.	Clarification only.
4	Simultaneous co-deposition Demonstrable simultaneous operation of (a) one valved cracker cell +one effusion cell + N-Plasma source, and (b) two effusion cells + one cracker cell, for h-BN and selenide co-deposition workflows: We can demonstrate what we supply ie N plasma or EB, 2 effusion cells are in options, 1 cracker is in options	Accepted. Demonstration of simultaneous operation shall be limited to the sources supplied in the offered configuration.	Clarification only.
5	Software & control: Can you pls put it as Optional	**Not Accepted.** Software-controlled operation, recipe execution, and data logging are essential system requirements. **Vendors may provide separate pricing if desired.**	Specification retained.
6	Quartz: Can you pls put it as Optional	**Not Accepted.** Quartz Crystal Microbalance is mandatory for flux monitoring and process calibration. **Vendors may provide separate pricing if desired.**	Specification retained.
7	VAT gate valve pneumatic: Request for Manual Valves	**Accepted.** Pneumatic gate valves or manual override are acceptable.	Tender specification amended.
8	Manual axial rotation for transfer: Transfer will be pick and place if Z 100 mm is required so no axial rotation Or if we mount on sidewall and keep axial rotation, then no Z in this configuration.	**Accepted.** Proposed transfer arrangement is acceptable provided all transfer and positioning specifications are met.	Subject to compliance verification.
9	7.1 to 7.4 Software and PC: Can you pls put it as Optional, since it's a high value & later on we will supply it form India with Better cost.	**Not Accepted.** System control software and dedicated workstation form an integral part of the delivered system.	Specification retained.
10	Spares: Can you pls put it as Optional	**Accepted.** Vendors may quote recommended spares separately. Evaluation will be based on the main system configuration.	Separate pricing permitted.

Response to Prebid Meeting: Kastech Technologies / UHP Tech

SN	Query	Response	Remark
Kastech Technologies / UHP Tech			

1.	Software & control: Full PC-based recipe execution, continuous data logging, and remote-access integration of additional instruments at no charge for two (2) years post-delivery. “Kindly specify the additional instrumentation components that can be integrated with the system during the two (2) years post-delivery support period."	**Clarified.** Provision shall be made for future integration of additional instruments such as RGA, AES, and other UHV-compatible analytical modules, subject to future budget availability.	Clarification only.
2.	Ports in confocal arrangement for existing and future integration of N-Plasma, effusion cell and/or e-beam evaporator (e-Beam: 02; K-Cell: 02; N-Plasma: 01; Thermal Cracker: 02): We recommend providing 6 ports in a symmetric confocal arrangement. Kindly confirm.	**Not Accepted.** Seven source ports are required to ensure operational flexibility and future expansion capability.	Specification retained.
3.	Blank ports for future addition of characterization facilities: Kindly specify the type of future characterization tools/facilities planned for integration, so that appropriate flange size, positioning, and chamber accessibility can be considered during system design.	**Clarified.** Provision shall support future integration of RGA and AES systems through suitable CF ports.	Clarification only.
4.	Free space for further mounting of valve banks for shutter and pneumatically operated gate valves, etc.: Kindly specify the additional valve banks or pneumatic units anticipated for future integration, including approximate quantity and utility requirements.	**Clarified.** Adequate space shall be provided for future pneumatic and shutter-control expansion.	Clarification only.
5.	VUV 40 CF full-metal vent valve: Kindly clarify the intended purpose and application of the VUV 40 CF full-metal vent valve in the system configuration.	**Clarified.** The valve is required for controlled venting of UHV chambers and turbomolecular pumps without compromising vacuum integrity.	Clarification only.
6.	Horizontally mounted on side-wall flange: Growth chamber must be of vertical deposition geometry with substrate facing downward during film growth. Kindly confirm the intended mounting orientation of the substrate manipulator. We recommend vertical mounting configuration for improved alignment, ease of transfer, and better mechanical stability.	**Confirmed.** Vertical substrate mounting configuration is required.	Tender specification amended.
7.	1 × Heated sample holder to 400 °C with power supply: Kindly clarify whether the requirement is for: (a) a heated substrate manipulator capable of heating up to 400 °C, or (b) a separate heated sample holder arrangement for preheating purposes.	**Accepted.** Either an independent heated holder or equivalent heated manipulator arrangement is acceptable, provided the specified temperature requirement is met.	Performance-based acceptance.
8.	Ports in confocal arrangement in Preparation chamber for future integration of effusion cells: Kindly specify the Preferred flange size, and intended future source types planned for integration in the preparation chamber.	**Clarified.** Ports shall support future integration of effusion-cell-based sources and associated accessories.	Clarification only.

9.	A view port to see the sample and transfer inside of the chamber: Kindly confirm the preferred location and purpose of the viewport for monitoring sample transfer: 1. Inside the preparation chamber during transfer operation, or 2. Loading/unloading position between Load Lock Chamber and Main Chamber.	**Clarified.** Visual monitoring shall be available for both sample transfer and loading/unloading operations.	Clarification only.
10.	Free space for further mounting of additional units to the media panel: Kindly specify the additional utilities or equipment expected to be incorporated in the media panel in future, so that adequate provisions can be considered.	**Clarified.** Provision shall be kept for future integration of additional process and characterization modules, including RGA, AES, additional sources, and related utilities.	Clarification only.
11.	Complete set of gaskets (15 no. of each type/size of flanges,Silver coated). For the upper flange of the main chamber and the preparation chamber which will rarely be opened one additional gasket should be provided. Kindly confirm whether silver-coated gaskets are mandatory for the entire system. We recommend OFHC copper gaskets for standard UHV sealing applications considering availability, reliability, and maintenance convenience. • Pressure Rating for Copper Gasket: 1*10^-12 mbar, Bakeable upto 400 C • Pressure Rating for Silver Gasket: 1*10^-12 mbar, Bakeable upto 400 C	**Accepted.** OFHC copper gaskets are acceptable provided all UHV and bake-out specifications are met.	Tender specification amended.
12.	Delivery Time lines: 10 months Considering the complexity, customization, integration, and testing requirements of the complete MBE system, we recommend a delivery timeline of 16 months. Kindly confirm if acceptable.	**Partially Accepted.** Maximum delivery period revised to 11 months.	Tender specification amended.
13.	Optional Items Medium-temperature effusion cell for Ga Kindly specify the required operating temperature range and crucible capacity for the Ga effusion cell.	Clarified. Vendors may propose suitable Ga effusion-cell configurations compatible with the offered system architecture.	Evaluation criterion.